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USDA and EEC POST-MORTEM INSPECTION

A Study Comparing the Effectiveness
of the Two Systems of Inspection

Project Manager
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Slaughter Inspection Standards and Procedures Division
Meat and Poultry Inspection Technical Services

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SUMMARY

The European Economic Community (EEC) Third Country Directive dealing with post-mortem inspection procedures calls for a number of incisions, observations and manipulations in addition to those routinely applied with the U.S. Department of Agriculture's (USDA) system of post-mortem inspection. The study reported in this document tested the hypothesis that . . . the USDA system of livestock post-mortem inspection is as effective as the EEC system at detecting and removing from the food supply diseased and abnormal product.

A total of 3,000 swine, 5,000 mature cattle, 1,000 calves, and 625 horses were examined at slaughter. The examinations took place in 11 different slaughterhouses located in different parts of the United States. Each carcass and its parts was first subjected to the USDA system of post-mortem inspection. Those passing were then subjected to the additional examinations prescribed with the EEC system of inspection.

The results of the study clearly showed that all different lesions detected by the EEC procedures were localized and did not affect carcass or parts disposition. It was therefore concluded that the above stated hypothesis is valid and that the EEC procedures have no additional public health benefits to contribute to the U.S. meat supply.

CONTENTS

INTRODUCTION

This is a report of a study conducted by the U.S. Department of Agriculture (USDA), Food Safety and Inspection Service, which empirically tested the following hypothesis:

> The USDA system of livestock post-mortem inspection is as effective as the European Economic Community (EEC) system at detecting and removing from the food supply diseased and abnormal product.

The report briefly explains why the study was conducted, describes the methodology used by the study team, and presents findings and conclusions of the effort.

In 1972 the EEC published a final version of its regulations detailing the public health controls on meat products imported into the Community from nonmember countries. These regulations are expressed in the Third Country Directive. In the early 1980's, the Commission of the EEC indicated its intention to enforce these regulations for all countries shipping product into the Community. By 1985, some level of compliance was acheived by a large majority of countries shipping meat to Europe, one notable exception being the United States.

There have been several discussions between USDA and EEC inspection officials about how compliance might be achieved in U.S. establishments. During those discussions USDA has consistently argued that its own inspectional requirements, while obviously different from those in the Third Country Directive, provide an equal level of control. One area in which the two systems have differing procedural requirements is in the conduct of post-mortem inspection of livestock.

The USDA routine post-mortem inspection procedures are described in detail in Appendix A. Routine post-mortem inspection of livestock in the United States is divided into three phases: (1) head inspection, (2) viscera inspection, and (3) carcass inspection. During each phase inspectors perform specific tasks which involve a sequence of observing, palpating, and incising certain tissues and lymph nodes. In order to facilitate comparison, EEC post-mortem procedures as expressed in the Third Country Directive have been similarly grouped. Tables 1-3 present the post-mortem procedures of the USDA and EEC systems for head inspection, viscera inspection, and carcass inspection respectively.

Exact procedural differences between the two systems are readily apparent from the tables. For example, Table 1 shows that procedures for examining the external masseter muscles in cattle and large calves are different in the two systems: the USDA procedures require a single incision parallel to the mandible, and the EEC procedures require two incisions parallel to the mandible. Similarly, Table 2 reveals that procedures for

Table 1 - USDA/EEC Head Inspection

Organ, Part	Bovine				Swine		Equine	
	Cattle/Large Calves (over 6 weeks)		Calves (under 6 weeks)					
	USDA	EEC	USDA	EEC	USDA	EEC	USDA	EEC
Head	Observe	Examine	Observe	Examine	Observe	Examine	Observe, not split (no glanders)	Examine, split (glanders)
External masseters	One incision parallel to mandible	Two incisions parallel to mandible	NA	NA	NA	NA	NA	NA
Internal masseters	One incision	One incision	NA	NA	NA	NA	NA	NA
Nasal Cavity, sinuses	NA	NA	NA	NA	NA	NA	-	Examine
Guttural pouch	NA	NA	NA	NA	NA	NA	Observe, palpate	-
Throat	Observe (with head/ tongue)	Examine	Observe (with head)	Examine	Observe (with head)	Examine	Observe (with head/tongue)	Examine
Larynx	Observe (with head/ tongue)	Examine	Observe (with head)	Examine	Observe (with head)	Examine	Observe (with head/tongue)	Examine
Tongue	Observe, palpate	Observe, palpate, incise ventral surface	Observe (with head)	Observe, palpate	Observe (with head) Plant: Observe, palpate; incise in sows, boars. Inspector: Observe/palpate 10 percent	Observe, palpate	Observe, palpate	Observe, palpate
Tonsils	Remove before (tongue) inspection	Examine, remove after inspection	Remove after inspection	Examine, remove after inspection	Remove after inspection	Examine, remove after inspection	Remove before (tongue) inspection	Examine
Mandibular lymph nodes	Incise, observe	Incise, observe	Observe (with head)	Incise, Observe	Incise, observe	Incise, Observe	Observe, palpate, incise when necessary	Incise, Observe
Retropharyngeal lymph nobes	Incise, observe	Incise, observe	Incise, Observe	Incise, Observe	Observe (with head)	Examine	Observe, palpate, incise when necessary	Incise, Observe
Parotid lymph nodes	Incise, observe	Incise, observe	Observe (with head)	Incise, Observe	Observe (with head)	Examine	Observe, palpate, incise when necessary	Incise, Observe
Atlantal lymph nodes	Incise, observe	-	NA	NA	NA	NA	NA	NA

Table 2 - USDA/EEC Viscera Inspection

Organ, Part	Bovine				Swine		Equine	
	Cattle/Large Calves (over 6 weeks)		Calves (under 6 weeks)					
	USDA	EEC	USDA	EEC	USDA	EEC	USDA	EEC
Pericardium	Observe (with heart)	Examine	Observe (with heart)	Examine	Observe (with heart)	Examine	Observe (with heart)	Examine
Heart	Observe, incise	Examine, incise two extra incisions	Observe, palpate	Examine, incise	Observe	Examine, incise	Observe, incise	Examine, incise
Trachea	Observe (with lungs)	Examine	Observe (with lungs)	Examine	Observe (with lungs)	Examine	Observe, (with lungs)	Examine
Trachea, main bronchi	-	Open lengthwise	-	Open length-wise	-	Open length-wise	-	Open length-wise
Lungs 1/	Observe, palpate	Observe, palpate incise	Observe, palpate	Observe, palpate, incise	Observe	Observe, palpate	Observe, palpate	Observe, palpate incise
Bronchial, mediastinal lymph nodes	Incise, observe	Incise, observe	Observe, palpate	Incise, observe	Observe, palpate	Examine	Observe, palpate incise when abnormal	Incise, observe
Liver	Observe, palpate	Observe, palpate	Observe, palpate	Observe, palpate	Observe	Observe, palpate	Observe, palpate	Observe, palpate
Gall bladder	Observe (with liver)	Examine	Observe (with liver)	Examine	Observe (with liver)	Examine	NA	NA
Bile ducts	Observe, open longi-tudinally	Examine, incise transversally	Observe (with liver)	Examine, incise transversally	Observe (with liver)	Examine	Observe, open longitudinally	Examine
Hepatic lymph nodes	Incise, observe	Incise, observe	Observe, palpate	Incise, observe	Palpate	Incise, observe	Observe, palpate	Incise, observe
Gastric, pancreatic lymph nodes	Observe (with viscera)	Incise, observe	Observe (with viscera)	Incise, observe	Observe (with viscera)	Incise, observe	Observe (with viscera	Incise, observe
Mesenteric lymph nodes	Observe	Incise, observe	observe (with viscera)	Incise, observe	Observe, palpate	Examine	Observe	Incise, observe
Ruminoreticular junction	Observe, palpate	Examine (with viscera)	Observe (with viscera)	Examine (with viscera)	NA	NA	NA	NA
Spleen	Observe	Observe, palpate	Observe	Observe, palpate	Observe	Observe, palpate	Observe, palpate	Observe, palpate
Uterus (edible use)	Cows: Not saved, observe; Heifers: Observe, palpate, incise when required	Cows: Saved incise, Heifers: observe	Observe (with viscera)	Examine (with viscera)	Sows: Not saved; observe; Gilts: Observe, palpate when required	Examine	Observe	Examine

1/ Lungs are considered inedible by USDA and edible by EEC. Incision is not required by EEC if lungs are not saved for human consumption.

Table 3 - USDA/EEC Carcass Inspection

Organ, Part	Bovine				Swine		Equine	
	Cattle/Large Calves (over 6 weeks)		Calves (under 6 weeks)					
	USDA	EEC	USDA	EEC	USDA	EEC	USDA	EEC
Skinning/Dehairing	Immediate, complete	Immediate, complete	Immediate, or after inspection and before reinspection	Immediate, complete	Immediate, complete	Immediate, complete	Immediate, complete	Immediate complete
Splitting	Before carcass inspection	Before inspection in over 6 months old carcasses	NA	NA	Before carcass inspection	Before inspection in over 4 weeks old carcasses	Before carcass inspection	Before inspection
Kidneys (capsule removed)	Observe, palpate	Examine	Observe, palpate	Examine	Grasp, turn, observe	Examine	Observe, palpate	Examine
Renal lymph nodes	Observe	Incise, observe	Observe	Incise,observe	Observe	Observe	Observe	Incise, observe
Supramammary lymph nodes	Palpate	Incise, observe	Observe (with carcass)	Incise, observe	Observe (with carcass)	Incise, observe	Palpate	Incise, observe
Superficial inguinal lymph nodes	Palpate	Bulls: Incise, observe, others: Examine	Observe (with carcass)	Examine	Observe (with carcass)	Boars: Incise observe, others:Examine	Palpate	Examine
Udder (edible use)	Lactacting not saved; others: observe, palpate, incise, reinspect	Cows: Examine, incise, others: Examine	Observe	Examine	Observe	Examine	Observe	Examine
Diaphragm	Observe, palpate	Remove serous from muscular part, examine	Observe	Examine	Observe	Examine	Observe,palpate	Examine
Internal iliac lymph nodes	Palpate	Examine	Observe, palpate	Examine	Observe (with carcass)	Examine	Palpate	Examine

examining mesenteric lymph nodes in cattle and large calves are also different: USDA requires observation only, and the EEC requires incision and observation. Taken together the tables provide a catalog of the differences in post-mortem requirements of the two systems.

One element of USDA post-mortem inspection is not clearly shown in the comparative tables. That is, in the United States when carcasses are found through routine examination procedures to be affected by a disease or abnormality, such carcasses are retained for a final inspection by veterinary medical officers (VMOs) who, depending on the disease or abnormality, perform more thorough and expanded examinations which include further observing, palpating, and incising of tissues and lymph nodes. Two examples of expanded procedures are included in Appendix B, USDA Expanded Post-Mortem Inspection for Bovine Cysticercosis and Eosinophilic Myositis. These two examples illustrate how USDA procedures are expanded when routine post-mortem examinations indicate the carcasses are affected with cysticercosis or eosinophilic myositis. These expanded procedures are in some cases quite similar to the routine EEC procedures; however, they are not used routinely in the U.S. system.

METHODOLOGY

Study Team and Project Design

FSIS scientific and technical experts from various disciplines selected to participate in the project were divided into two groups. The planning and evaluation group of team members designed and developed the project and analyzed the data. The inplant testing group conducted the field evaluations in 11 U.S. establishments and collected all necessary data. The study team members are listed in Appendix C.

The overall approach used by the team was conceptually simple and direct: regular USDA inspectors conducted routine USDA post-mortem procedures, and specially trained study team members performed EEC post-mortem procedures. After each performed his task, an evaluator observed each carcass and recorded any disease or abnormality detected. Data were analyzed and conclusions drawn. In order for this conceptually simple design to yield data which were valid, objective and comparable, a number of specific prerequisites and safeguards had to be achieved. These are described below.

Selection of Plants

From the universe of livestock slaughter plants operating under USDA inspection, a candidate group of 50 then exporting to the EEC was identified. This group was subsequently reduced to 23 which, after examination of their blueprints, were visited and reviewed by the project manager to determine their feasibility for inplant testing. Eleven of the 23 plants reviewed were finally selected. This selection was made on the basis of a number of factors including: (1) adequate facilities, equipment and space to conduct the necessary evaluations; (2) chain speed and daily slaughter volume sufficient to evaluate the required number of units; (3) slaughter of species currently providing exports to the EEC; (4) appropriate disease incidence in animals slaughtered; (5) location; and (6) plant management attitude.

At each plant the studies were completed within approximately a 5-day period. The overall study was completed between June 25, 1984, and January 29, 1985. A description of the 11 plants is listed below:

Plant No.	Type of Animals	Line Speed/Hr
1	Market Hogs	780
2	Market Hogs	780
3	Sows/Boars	300
4	Steers/Heifers	90
5	Steers/Heifers	244
6*	Steers/Heifers	25
7*	Steers/Heifers	60
8**	Large Calves	80
8A**	Small Calves	130
9	Cows/Bulls	120
10	Horses	25
11	Horses	25

*Plants 6 and 7 were used because of their relatively high incidence of reported bovine cysticercosis.

**Plants 8 and 8A are one plant slaughtering large and small calves.

Presentation Methods

In the United States, slaughter plant facilities, equipment, and layouts are variable within certain limits set by inspection controls. These variations will affect how carcasses are presented for inspection. The 11 plants selected exhibited usual variability in this aspect of their operations. In order to accommodate having team members perform an additional and different set of post-mortem inspection procedures, modifications in existing presentation methods were sometimes made as described in the following paragraphs.

Cattle Plants. At plants 4, 5, 7, and 10, heads were presented for inspection on a moving chain with the tongues removed and hung on hooks beside the heads.

At plants 4, 5, 7, and 10, the carcasses were skinned and eviscerated while hung on a moving chain. At plant 6, they were skinned on the floor in two areas (beds) and hung at a certain height for evisceration and inspection of carcass hindquarters. Subsequently, carcasses were hung on a hand-push rail for splitting. In these five plants, carcasses were split before being presented for inspection.

To evaluate the EEC procedures at these five plants, the tonsils were not removed when the tongues were freed from the heads; tonsils were left attached to the tongues until the required inspection and evaluation were completed. Also, to expose the muscular part of the diaphragm, a plant or inspection employee removed the serous part before carcass evaluation.

At plant 8, the heads were presented for inspection in round racks on a moving viscera table and the viscera in pans next to the corresponding heads. The carcasses were suspended from a rail, washed, eviscerated and presented for inspection with the skin attached and the ventral surface toward the inspector. To evaluate the tongues with the tonsils and larnyx, a plant employee presented them after they were removed from the heads. To evaluate the skinned carcass surfaces and the spinal column, carcasses of calves under 6 weeks old (small calves) were skinned and those of calves over 6 weeks old (large calves) were skinned and split in the coolers the next day.

Swine Plants. At plants 1 and 2, the carcasses were shaved and cleaned; at plant 3 they were skinned. At all three plants the carcasses were presented for inspection after the heads were disarticulated at the atlanto-occipital joint and were left hanging freely from the carcasses by a small section of the neck skin. The carcasses were suspended from a moving rail and positioned so that each carcass back faced the inspector.

After leaving the head inspection station, the carcasses were eviscerated and positioned so that their ventral surfaces faced the viscera inspectors. At the carcass inspection stations, they were presented for inspection with the kidneys exposed and the ventral surfaces facing the inspector. During the study, the existing methods of presenting swine heads, viscera and carcasses for inspection were not changed. However, to be able to evaluate the tongues with the tonsils and larynx at the head inspection station, additional plant employees freed the tongues from the heads, after the heads were disarticulated from the carcass and left them hanging with the tonsils and larynx exposed.

Horse Plants. At both plants 11 and 12, the heads were skinned, washed and presented for inspection on a stationary head rack. After the heads' surfaces and lymph nodes were inspected, the

tongues were freed from the heads and presented for inspection with the tonsils and larynx attached. After the appropriate inspection and evaluation were completed, the heads were split in the median plane to evaluate the nasal cavities.

At plant 11, after the carcasses were skinned in one area (bed) on the floor, they were raised on a hand-push rail, eviscerated, split and presented for inspection. The viscera were presented for inspection on a stationary table. At plant 12, the carcasses were skinned while hanging on a hand-push rail, lowered for evisceration and carcass inspection of hindquarters, raised up again on a hand-push rail, split and presented for inspection. The viscera were presented for inspection in viscera trucks.

Evaluation of USDA and EEC Procedures

Table 4 summarizes the total number of animals evaluated in this study.

Slaughter inspection procedures are complex, detailed and interrelated and vary significantly with the species and type of animal involved. Evaluating the effectiveness of the two sets of requirements can be accomplished by looking at specific animal parts after a series of procedures have been performed and determining if any disease conditions or abnormalities are present. The different units, that is, the part, organ or tissue, which were evaluated are set forth in Table 5. For example, when the USDA and the EEC inspection procedures for large calves were studied, evaluations were conducted on the head, the thoracic viscera, the abdominal viscera, and on either the carcass nonskinned or skinned and split, depending on the plant's production practices. For another example, when the heads of large calves were evaluated, the external and internal masseter muscles, the tongue, larnyx and tonsils were specifically examined because the USDA and EEC procedures differ somewhat for each of these parts.

The actual step-by-step technique used by the inplant testing group to study and evaluate the different inspection procedures is described in detail in Appendix D for each species and type of animal. In all cases, the USDA inspection procedures were performed by inspectors regularly assigned to the test plants. The EEC procedures were performed by VMO study team members.

While the units which were to be evaluated (heads, thoracic viscera, abdominal viscera and carcasses) were inspected with USDA procedures by the inspectors, an evaluator/recorder for the USDA procedures evaluated the performance of the USDA tasks, observed the units and recorded any disease or abnormality detected. Subsequently, either down the line or next to the inspection station, a VMO team member examined the same units by performing the EEC procedures. His work was reviewed by an evaluator/recorder who evaluated the performance of the EEC tasks, observed the units and recorded any disease or abnormality

detected. These procedures were used in seven plants. In four plants, because of the relatively slow line speeds, it was possible for the VMO evaluator/recorder at each evaluation site to observe and note any disease or abnormality for both the USDA and EEC procedures.

Table 4 - Number of Animals Evaluated

Type of Animal	Number
Market Hogs	2,000
Sows/Boars	1,000
Swine Total	- 3,000 -
Steers/Heifers	4,000
Large Calves	500
Small Calves	500
Cows/Bulls	1,000
Cattle Total	- 6,000 -
Horses Total	- 625 -
Total Number of Animals	- 9,625 -

Table 5 - Units Evaluated

Type of Animal	Evaluation Site	Units (Part, Organ, Tissue)
Swine	Head	Tongue, larynx, tonsils.
	Thoracic Viscera	Heart.
	Carcass	Both sides of carcass; spinal column; superficial inguinal or supramammary lymph nodes.
Steers/Heifers	Head	External and internal masseters, tongue, larynx, tonsils.
	Thoracic Viscera	Trachea, main bronchi, lungs, heart.
	Abdominal Viscera	Liver; gastric, pancreatic and mesenteric lymph nodes.
	Carcass	Both sides of carcass; spinal column; renal, superficial inguinal or supramammary lymph nodes; diaphragm.
Large Calves	Head	External and internal masseters, tongue, larynx, tonsils.
	Thoracic Viscera	Trachea, main bronchi; lungs, heart.
	Abdominal Viscera	Liver, gastric, pancreatic and mesenteric lymph nodes.
	Carcass-Nonskinned Skinned/Split	Both sides of carcass; spinal column; renal, superficial inguinal or supramammary lymph nodes; diaphragm.
Small Calves	Head	Head lymph nodes, tongue, larynx, tonsils.
	Thoracic Viscera	Trachea, main bronchi; lungs, heart, mediastinal and bronchial lymph nodes.
	Abdominal Viscera	Liver, hepatic, gastric pancreatic and mesenteric lymph nodes.
	Carcass-Nonskinned Skinned	Carcass; renal, superficial inguinal or supramammary lymph nodes; diaphragm.
Cows/Bulls	Head	External and internal masseters, tongue, larynx, tonsils.
	Thoracic Viscera	Trachea, main bronchi, lungs, heart.
	Abdominal Viscera	Liver; gastric, pancreatic and mesenteric lymph nodes; uterus.
	Carcass/Udder	Both sides of carcass; spinal column, renal, superficial inguinal or supramammary lymph nodes, diaphragm, udder.
Horses	Head	Mandibular, retropharyngeal and parotid lymph nodes; guttural pouch, throat, larynx, tonsils, split head, nasal cavity, sinuses.
	Thoracic Viscera	Trachea, main bronchi; lungs, bronchial and mediastinal lymph nodes.
	Abdominal Viscera	Liver, hepatic gastric, pancreatic and mesenteric lymph nodes.
	Carcass	Both sides of carcass, spinal column, superficial inguinal or supramammary and renal lymph nodes.

Controls

Throughout the preparation for and conduct of the study certain activities were performed to assure that proper controls were in place. For example, participants in the on-site data collection activity were all trained by the project manager. He first trained involved plant employees to perform the different presentation methods; then he trained the VMO team members who were to perform the EEC procedures. Training continued until the plant employees were doing the presentation methods properly and the VMO team members were confident in examining the heads, viscera and carcasses using the EEC procedures.

After training, a pilot test was conducted. This test was designed to allow plant employees, inspectors and evaluators to become familiar with the testing process and to allow the project manager to make any adjustments before the actual test began. During the pilot test, data were collected and reviewed, but were not included in the study.

During the pilot test and before the beginning of each evaluation, the project manager reviewed the methods of presenting the units (heads, thoracic viscera, abdominal viscera, carcasses) for inspection and instructed designated plant representatives to make any adjustments, if necessary. Then, he instructed the inspectors and VMOs to perform the designated procedures. He delayed the beginning of the evaluation until he reviewed and determined that all units were properly presented for inspection and the appropriate procedures were performed correctly.

During the in plant testing, the project manager took a number of actions to exclude operational quirks which might bias the data. He randomized selection of the order in which the various evaluations would be performed. He randomized assignment of team personnel to the three possible positions which they might carry out. He also rotated inspectors performing the USDA procedures and team members performing the EEC procedures.

When collecting the data, evaluators selected units according to a set plan. The evaluators randomly selected 100 units as follows: when instructed by the project officer in charge, they selected a unit as it went by on the line or at a stationary point. This unit was not to be examined but to be used as a starting point. The sixth unit following the starting point was the first one to be evaluated. The evaluators examined the unit and recorded on worksheets any disease or abnormality detected.

When the evaluators completed the first unit, they selected the next unit as it became available, examined it and had the results recorded. The remaining units were selected, examined and results recorded as they too became available, until 100 were examined and the results recorded.

RESULTS

The results obtained in each plant are summarized in Tables 6 through 17. Each table includes:

1. Evaluation site.

2. Total abnormal units detected by USDA procedures.

3. Total abnormal units detected by EEC procedures.

4. Abnormal units with same lesions detected by USDA and EEC procedures.

5. Lesions detected by USDA procedures but not by EEC procedures.

6. Lesions detected by EEC procedures but not by USDA procedures.

7. Percent of lesions detected by USDA procedures but not by EEC procedures.

8. Percent of lesions detected by EEC procedures but not by USDA procedures.

Table 6 -- Evaluation of USDA and EEC Post-Mortem Inspection Procedures As Applied to 1,000 Market Hogs in Plant No. 1

Evaluation Site1/	Abnormal Units Detected						
	Total		Same Lesions	Different Lesions			
				Number of Units		Percent	
	USDA	EEC	USDA/EEC	USDA	EEC	USDA	EEC
Head	0	0	0	0	0	.0	.0
Thoracic Viscera	32	32	32	0	0	.0	.0
Carcass	40	40	40	0	0	.0	.0

1/Units evaluated at each site: 1,000

Table 6, Interpretation

Head. All units evaluated were free of lesions.

Thoracic viscera; carcass. Both procedures detected the same lesions.

Significance. There was no difference between the two procedures.

Table 7 -- Evaluation of USDA and EEC Inspection Procedures As Applied to 1,000 Market Hogs in Plant No. 2

Evaluation Site1/	Abnormal Units Detected						
	Total		Same Lesions	Different Lesions			
				Number of Units		Percent	
	USDA	EEC	USDA/EEC	USDA	EEC	USDA	EEC
Head	0	0	0	0	0	.0	.0
Thoracic Viscera	22	22	22	0	0	.0	.0
Carcass	11	17	11	0	6	.0	.6

1/Units evaluated at each site: 1,000

Table 7, Interpretation

Head. All units evaluated were free of lesions.

Thoracic viscera. Both procedures detected same lesions.

Carcass. USDA procedures detected 11 abnormal units and EEC procedures 17; both detected 11 units with same lesions and EEC procedures six different units with lymph node lesions.

Significance. All different unit lesions detected by the EEC procedures were localized, associated with bruises and did not affect carcass or parts disposition.

Table 8 -- Evaluation of USDA and EEC Post-Mortem Inspection Procedures as Applied to 1,000 Sows and Boars in Plant No. 3

Evaluation Site1/	Abnormal Units Detected						
	Total		Same Lesions	Different Lesions			
				Number of Units		Percent	
	USDA	EEC	USDA/EEC	USDA	EEC	USDA	EEC
Head	0	0	0	0	0	.0	.0
Thoracic Viscera	19	19	19	0	0	.0	.0
Carcass	48	51	48	0	3	.0	.3

1/Units evaluated at each site: 1,000

Table 8, Interpretation

Head. All units evaluated were free of lesions.

Thoracic viscera. Both procedures detected the same lesions.

Carcass. USDA procedures detected 48 abnormal units and EEC procedures 51; both detected 48 units with same lesions and EEC procedures three different units with lymph node lesions.

Significance. The different unit lesions were localized and associated with lactating mammary glands and did not affect carcass or parts disposition.

Table 9 -- Evaluation of USDA and EEC Post-Mortem Inspection Procedures as Applied to 1,000 Steers and Heifers in Plant No. 4

Evaluation Site1/	Abnormal Units Detected						
	Total		Same Lesions	Different Lesions			
				Number of Units		Percent	
	USDA	EEC	USDA/EEC	USDA	EEC	USDA	EEC
Head	8	11	8	0	3	.0	.3
Thoracic Viscera	28	29	27	1	2	.1	.2
Abdominal Viscera	183	168	167	16	1	1.6	.1
Carcass	12	15	12	0	3	.0	.3

1/Units evaluated at each site: 1,000

Table 9, Interpretation

Head. USDA procedures detected eight abnormal units and EEC procedures 11; both detected eight units with the same lesions and EEC procedures three different units with tonsil lesions.

Thoracic viscera. USDA procedures detected 28 abnormal units and EEC procedures 29; both detected 27 units with the same lesions. USDA procedures detected one different unit with heart lesions and EEC procedures two different units with trachea lesions.

Abdominal viscera. USDA procedures detected 183 abnormal units and EEC procedures 168; both detected 167 units with same lesions. USDA procedures detected 16 different units with liver lesions and EEC procedures one different unit with a lymph node lesion.

Carcass. USDA procedures detected 12 abnormal units and EEC procedures 15; both detected 12 units with same lesions and EEC procedures three different units with lymph node lesions.

Significance. The EEC transverse incisions of the bile ducts did not always detect distomatosis as did the USDA longitudinal incisions. All different unit lesions detected by the EEC procedures were localized and did not affect carcass disposition.

Table 10 -- Evaluation of USDA and EEC Inspection Procedures as Applied to 1,000 Steers and Heifers in Plant No. 5

Evaluation Site1/	Abnormal Units Detected						
	Total		Same Lesions	Different Lesions			
				Number of Units		Percent	
	USDA	EEC	USDA/EEC	USDA	EEC	USDA	EEC
Head	12	15	12	0	3	.0	.3
Thoracic Viscera	32	34	32	0	2	.0	.2
Abdominal Viscera	152	117	117	35	0	3.5	.0
Carcass	10	15	10	0	5	.0	.5

1/Units evaluated at each site: 1,000

Table 10, Interpretation

Head. USDA procedures detected 12 abnormal units and EEC procedures 15; both detected 12 units with same lesions and EEC procedures three different units with tonsil lesions.

Thoracic viscera. USDA procedures detected 32 abnormal units and EEC procedures 34; both detected 32 units with same lesions and EEC procedures two different units with trachea/bronchi lesions.

Abdominal viscera. USDA procedures detected 152 abnormal units and EEC procedures 117; both detected 117 units with same lesions. USDA procedures detected 35 different units with liver lesions.

Carcass. USDA procedures detected 10 abnormal units and EEC procedures 15; both detected 10 units with same lesions and EEC procedures five different units with lymph node lesions.

Significance. The EEC transverse incisions of the bile ducts did not detect all distomatosis lesions as did the USDA longitudinal incisions. All different unit lesions detected by the EEC procedures were localized and did not affect carcass or part disposition.

Table 11 -- Evaluation of USDA and EEC Inspection Procedures as Applied to 1,000 Steer and Heifers in Plant No. 6

Evaluation Site1/	Abnormal Units Detected						
	Total		Same Lesions	Different Lesions			
				Number of Units		Percent	
	USDA	EEC	USDA/EEC	USDA	EEC	USDA	EEC
Head	18	22	18	0	4	.0	.4
Thoracic Viscera	34	30	30	4	0	.4	.0
Abdominal Viscera	217	211	210	7	1	.7	.1
Carcass	34	34	33	1	1	.1	.1

1/Units evaluated at each site: 1,000

Table 11, Interpretation

Head. USDA procedures detected 18 abnormal units and EEC procedures 22; both detected 18 units with same lesions. EEC procedures detected one unit with a tongue lesion, two units with tonsil lesions and one unit with a lesion of cysticercosis, detected also by USDA procedures.

Thoracic viscera. USDA procedures detected 34 abnormal units and EEC procedures 30; both detected 30 units with same lesions. USDA procedures detected four different units with heart lesions.

Abdominal viscera. USDA procedures detected 217 abnormal units and EEC procedures 211; both detected 210 units with same lesions. USDA procedures detected seven different units with liver lesions and EEC procedures one different unit with a lymph node lesion.

Carcass. Each procedure detected 34 abnormal units and 33 units with same lesions. USDA procedures detected one different unit with diaphragm lesions and EEC procedures one different unit with lymph node lesion associated with localized bruises.

Significance. The USDA procedures detected a total of 12 units with different lesions and the EEC procedures a total of six units with localized lesions, which did not affect carcass or parts disposition. The EEC procedures for the liver, heart and diaphragm did not detect all lesions of diseases or abnormalities detected with the USDA procedures.

Table 12 -- Evaluation of USDA and EEC Inspection Procedures as Applied to 1,000 Steers and Heifers in Plant No. 7

Evaluation Site1/	Abnormal Units Detected						
	Total		Same Lesions	Different Lesions			
				Number of Units		Percent	
	USDA	EEC	USDA/EEC	USDA	EEC	USDA	EEC
Head	12	12	12	0	0	.0	.0
Thoracic Viscera	24	24	24	0	0	.0	.0
Abdominal Viscera	111	97	97	14	0	1.4	.0
Carcass	13	15	13	0	2	.0	.2

1/Units evaluated at each site: 1,000

Table 12, Interpretation

Head; thoracic viscera. Both procedures detected same lesions.

Abdominal viscera. USDA procedures detected 111 abnormal units and EEC procedures 97; both detected 97 units with same lesions. USDA procedures detected 14 different units with liver lesions.

Carcass. USDA procedures detected 13 abnormal units and EEC procedures 15; both detected 13 units with same lesions and EEC procedures two different units with lymph node lesions.

Significance. The EEC transverse incisions of the bile ducts did not detect all distomatosis lesions as did the USDA longitudinal incisions. All different unit lesions detected by the EEC procedures were localized and did not affect carcass or parts disposition.

Table 13 -- Evaluation of USDA and EEC Post-Mortem Inspection Procedures as Applied to 500 Large Calves in Plant No. 8

Evaluation Site1/	Abnormal Units Detected						
	Total		Same Lesions	Different Lesions			
				Number of Units		Percent	
	USDA	EEC	USDA/EEC	USDA	EEC	USDA	EEC
Head	1	3	1	0	2	.0	.4
Thoracic Viscera	26	26	26	0	0	.0	.0
Abdominal Viscera	4	4	4	0	0	.0	.0
Carcass	2	2	2	0	0	.0	.0

1/Units evaluated at each site: 500

Table 13, Interpretation

Head. USDA procedures detected one abnormal unit and EEC procedures three; both detected one unit with same lesion and EEC procedures two different units with localized tonsil lesions.

Thoracic viscera; abdominal viscera; carcass. Both procedures detected same lesions.

Significance. All different unit lesions detected by the EEC procedures were localized and did not affect carcass or parts disposition.

Table 14 -- Evaluation of USDA and EEC Post-Mortem Inspection Procedures as Applied to 500 Small Calves in Plant No. 8A

Evaluation Site1/	Abnormal Units Detected						
	Total		Same Lesions	Different Lesions			
				Number of Units		Percent	
	USDA	EEC	USDA/EEC	USDA	EEC	USDA	EEC
Head	1	2	1	0	1	.0	.2
Thoracic Viscera	0	0	0	0	0	.0	.0
Abdominal Viscera	8	8	8	0	0	.0	.0
Carcass	0	0	0	0	0	.0	.0

1/Units evaluated at each site: 500

Table 14, Interpretation

Head. USDA procedures detected one abnormal unit and EEC procedures two; both detected one unit with same lesion and EEC procedures one different unit with localized tonsil lesion.

Thoracic viscera. All units were free of lesions.

Abdominal viscera. Both procedures detected same lesions.

Carcass. All units were free of lesions.

Significance. All different unit lesions detected by the EEC procedures were localized and did not affect carcass or parts disposition.

Table 15 -- Evaluation of USDA and EEC Inspection Procedures as Applied to 1,000 Cows and Bulls in Plant No. 9

Evaluation Site1/	Abnormal Units Detected						
	Total		Same Lesions	Different Lesions			
				Number of Units		Percent	
	USDA	EEC	USDA/EEC	USDA	EEC	USDA	EEC
Head	23	25	23	0	2	.0	.2
Thoracic Viscera	35	35	35	0	0	.0	.0
Abdominal Viscera	245	221	221	24	0	2.4	.0
Carcass	63	57	57	6	0	.6	.0

1/Units evaluated at each site: 1,000

Table 15, Interpretation

Head. USDA procedures detected 23 abnormal units and EEC procedures 25; both detected 23 units with same lesions and EEC procedures two different units with tonsil lesions.

Thoracic viscera. Both procedures detected same lesions.

Abdominal viscera. USDA procedures detected 245 abnormal units and EEC procedures 221; both detected 221 units with same lesions. USDA procedures detected 24 different units with liver lesions.

Carcass. USDA procedures detected 63 abnormal units and EEC procedures 57; both detected 57 units with same lesions. USDA procedures detected six different units with udder lesions.

Significance. The EEC transverse incisions of the bile ducts did not always detect distomatosis, as did the USDA longitudinal incisions, and the EEC procedures on the udder frequently did not detect the same diseases or abnormalities detected by the USDA procedures. All different unit lesions detected by the EEC procedures were localized and did not affect carcass or parts disposition.

Table 16 -- Evaluation of USDA and EEC Inspection Procedures as Applied to 125 Horses in Plant No. 10

Evaluation Site1/	Abnormal Units Detected						
	Total		Same Lesions	Different Lesions			
				Number of Units		Percent	
	USDA	EEC	USDA/EEC	USDA	EEC	USDA	EEC
Head	4	5	4	0	1	.0	.1
Thoracic Viscera	8	9	8	0	1	.0	.1
Abdominal Viscera	27	27	27	0	0	.0	.0
Carcass	2	2	2	0	0	.0	.0

1/Units evaluated at each site: 125

Table 16, Interpretation

Head. USDA procedures detected four abnormal units and EEC procedures five; both detected four units with same lesions and EEC procedures one different unit with a localized nasal cavity lesion.

Thoracic viscera. USDA procedures detected eight abnormal units and EEC procedures nine; both detected eight units with same lesions and EEC procedures one different unit with a localized trachea lesion.

Abdominal viscera; carcass. Both procedures detected same lesions.

Significance. All different unit lesions detected by the EEC procedures were localized and did not affect carcass or parts disposition.

Table 17 -- Evaluation of USDA and EEC Inspection Procedures as Applied to 500 Horses in Plant No. 11

Evaluation Site1/	Abnormal Units Detected						
	Total		Same Lesions	Different Lesions			
				Number of Units		Percent	
	USDA	EEC	USDA/EEC	USDA	EEC	USDA	EEC
Head	26	28	26	0	2	.0	.4
Thoracic Viscera	64	66	64	0	2	.0	.4
Abdominal Viscera	87	90	87	0	3	.0	.6
Carcass	6	6	6	0	0	.0	.0

1/Units evaluated at each site: 500

Table 17, Interpretation

Head. USDA procedures detected 26 abnormal units and EEC procedures 28; both detected 26 units with same lesions and EEC procedures two different units with localized tonsil lesions.

Thoracic viscera. USDA procedures detected 64 abnormal units and EEC procedures 66; both detected 64 units with same lesions and EEC procedures two different units with localized bronchi lesions.

Abdominal viscera. USDA procedures detected 87 abnormal units and EEC procedures 90; both detected 87 units with same lesions and EEC procedures three different units with localized lymph node lesions.

Carcass. Both procedures detected same lesions.

Significance. All different unit lesions detected by the EEC procedures were localized and did not affect carcass or parts disposition.

DISCUSSION

USDA and EEC Cattle Post-Mortem Inspection Compared

USDA requires that the external masseters be incised with one incision parallel to the mandible in cattle and large calves. EEC requires that they be incised with two incisions parallel to the mandible in bovine over 6 weeks old. In four plants, the USDA and EEC procedures did not detect any lesions in the external masseters. In two plants, the USDA and EEC procedures detected five units with the same lesions, and the EEC procedures detected one unit with a lesion of the same disease detected by the USDA procedures. The second incision required by EEC did not detect any additional diseases or abnormalities.

USDA requires that the tongue be observed and palpated in cattle and large calves; in other calves, it is observed with the head. EEC requires that the tongue be observed, palpated and incised lengthwise in the ventral surface in bovines over 6 weeks old; in calves under 6 weeks old, it must be observed and palpated. In the six bovine plants, the USDA and EEC procedures detected the same lesions in the tongues, except for one unit which had a small, localized lesion detected by the EEC procedures. The incising of the tongue in the six plants resulted in loss of market values and frequently in reduction of plant productivity. Evaluations of the tongues in calves under 6 weeks old did not detect diseases or abnormalities.

USDA requires that the tonsils be removed before (tongue) inspection in cattle and large calves; in other calves, they are removed after inspection. EEC requires that bovine tonsils be removed after inspection. During the study, the USDA procedures did not include examinations of the tonsils; therefore, only the EEC procedures detected tonsil lesions. In all six bovine plants, they detected a total of 13 units or 0.2 percent units with lesions, which were slight, localized and did not affect organ or carcass disposition.

In small calves, USDA requires that the mandibular and parotid lymph nodes be observed with the head surfaces. EEC requires that they be incised and observed. During the inplant evaluations, neither procedure detected any lesions in these lymph nodes.

USDA requires that the atlantal lymph nodes be incised and observed in cattle and large calves. EEC does not mention examining these lymph nodes. However, during the study, the USDA procedures did not detect any lesions in these lymph nodes.

USDA requires that hearts of small calves be observed and palpated. EEC requires that they be incised and, in addition, those of bovine over 6 weeks old be split from two opposite points from auricles to apex. In small calves, neither procedure detected any lesions in the hearts. In other bovine, both

procedures detected 27 units with the same lesions, and the USDA procedures detected five units with different lesions. The EEC additional incisions in cattle and large calves did not detect all lesions found with the USDA procedures.

USDA requires that bovine trachea be observed during lung examination. EEC requires that the trachea be examined and opened lengthwise with the main branches of bronchi. In large and small calves, neither procedure detected any lesions. In other bovine, they detected 25 units with the same lesions, and the EEC procedures detected three different units with slight and localized lesions which did not affect carcass disposition. Opening of the trachea did not detect any disease affecting carcass disposition.

USDA requires that bovine lungs be observed and palpated and not saved for human consumption. EEC requires that they be incised in their posterior third, perpendicular to their main axes, if saved for human consumption. In small calves, neither procedure detected any lesions in the lungs. In other bovine, both procedures detected the same lesions. The EEC lungs incisions did not reveal additional diseases or abnormalities.

USDA requires that the bronchial and mediastinal lymph nodes be observed and palpated in calves. EEC requires that they be incised and observed. In all units evaluated, neither procedure detected any lesions.

USDA requires that the bile ducts be opened longitudinally in cattle and large calves and observed with the liver in small calves. EEC requires that they be examined and incised transversally on the liver's ventral surface and under the caudate lobe in bovine. In large and small calves, all units evaluated were free of lesions under both procedures. In other bovine, the USDA and EEC procedures detected 75 units with the same lesions, and the USDA procedures detected 97 different units with lesions. The transverse incisions required by EEC did not detect all the distomatosis lesions detected with the longitudinal incisions done by USDA.

USDA requires that the hepatic lymph nodes be observed and palpated in calves. EEC requires that they be incised and observed. Neither procedure detected any lesions in these lymph nodes.

USDA requires that bovine gastric and pancreatic lymph nodes be observed with the viscera. EEC requires that they be incised and observed. In small calves, all units were free of lesions; in other bovine, both procedures detected the same lesions.

USDA requires that the mesenteric lymph nodes be observed in bovine. EEC requires that they be incised and observed. In large and small calves, both procedures detected the same lesions. In other bovine, both procedures detected 25 units with

the same lesions, and the EEC procedures detected two different units with small, localized lesions that did not affect carcass disposition.

USDA requires that cow uteri not be saved for human consumption and those of heifers be observed and, when necessary, palpated if saved for human consumption. EEC requires that cow uteri be opened lengthwise if saved for human consumption. In the cow plant, evaluations of the uteri revealed that both procedures detected the same lesions.

USDA permits skinning of calves after online inspection but requires that they be inspected after skinning; it does not require that they be split before inspection. EEC requires that calf carcasses be skinned and bovine carcasses over 6 months old be split before inspection. During the study, calves over 6 weeks old were skinned and split, and those under 6 weeks old were skinned. Neither procedure detected any lesions in the skinned/split or skinned carcasses.

USDA requires that bovine kidneys be observed and palpated and renal lymph nodes area be observed. EEC requires that kidneys be examined and renal lymph nodes be incised and observed. In large and small calves, all renal lymph nodes evaluated were free of lesions. In other bovine carcasses, the USDA and EEC procedures detected 50 units with the same lesions in the renal lymph nodes, and the EEC procedures detected five different units with lesions associated with chronic kidney lesions.

USDA requires that the supramammary lymph nodes of cattle and large calves be palpated and those of small calves be observed. EEC requires that they be incised and observed. In large and small calves, the supramammary lymph nodes were free of lesions under both procedures. In other bovine plants, both procedures detected 24 units with the same lesions, and the EEC procedures detected two different units with lesions which were associated with localized udder lesions.

USDA requires that the superficial inguinal lymph nodes of cattle and large calves be palpated and those of small calves be observed. EEC requires that the superficial inguinal lymph nodes of bulls be incised and observed. During the study, these lymph nodes were evaluated in all species. In small calves and two more bovine plants, including the bull plant, these lymph nodes were free of lesions under both procedures. In the other bovine plants, both procedures detected seven units with the same lesions, and the EEC procedures detected four different units with lesions. These lesions were associated with bruises and did not affect carcass disposition.

USDA requires that lactating udders not be saved for human consumption and nonlactating cow udders be examined and palpated by an inspector; when necessary, they must be incised by plant employee(s) in sections not greater than 2 inches in thickness

and then reinspected by an inspector; other udders must be observed. EEC requires that cow udders be examined and incised by a long, deep incision as far as the lactiferous sinuses, if saved for human consumption; other udders must be examined. Both procedures detected 32 units with the same lesions, and the USDA procedures, detected six different units with lesions. The incisions required by EEC did not detect all lesions.

USDA requires that the diaphragm of cattle and large calves be observed and palpated, that of small calves be observed. EEC requires that the diaphragm of bovine carcasses be examined after removal of the serous part, except in calves. In calves, all units evaluated were free of lesions. In other bovine, both procedures detected 10 units with the same lesions, and the USDA procedures detected one different unit with lesions.

USDA and EEC Swine Post-Mortem Inspection Compared

USDA requires that tongues of sows, stags and boars be palpated and incised and tongues of other swine be observed and palpated by plant employee(s) for abscesses; an inspector is required to examine and palpate 10 percent of all tongues. EEC requires that tongues be observed and palpated for cysticercosis. During the study, all tongues were freed from the heads and presented for inspection at the head inspection station with the larynx and tonsils. All units evaluated in the three swine plants were free of lesions.

Under USDA inspection, tonsils are removed after inspection. EEC also requires that they be removed after inspection. During the inplant evaluations, the tonsils were observed and palpated only under the EEC procedures, and all were free of lesions.

USDA requires that swine hearts be observed. EEC requires that they be examined and incised. In all three swine plants, both procedures detected the same lesions.

USDA requires that supramammary or superficial inguinal lymph nodes be observed. EEC requires that the supramammary lymph nodes be incised and observed and the superficial inguinal lymph nodes be examined, and incised and observed in boars. During the study, all these lymph nodes were observed by the USDA procedures, and incised and observed by the EEC procedures. During evaluation of the superficial inguinal lymph nodes, both procedures detected the same lesions in one market hog plant and in the sow/boar plant. In the other market hog plant, three different lesions were detected by incising, which did not affect carcass disposition. In evaluating the supramammary lymph nodes, both procedures detected 57 units with the same lesions, and the EEC procedures detected six different units with lesions which were associated with lactating mammary glands and/or bruises and did not affect carcass disposition.

USDA and EEC Horse Post-Mortem Inspection Compared

USDA requires equine head surfaces be observed. Because the United States is free of glanders, USDA does not require heads to be routinely split and sinuses closely examined, unless otherwise indicated. Because of glanders, EEC requires that the nasal cavity and sinuses be examined after the head is split in the median plane and the nasal septum excised. In the two equine plants, both procedures detected two units with the same lesions in the nasal cavity, and the EEC procedures detected one different unit with a localized lesion that did not affect carcass disposition.

USDA requires that equine guttural pouch be observed and palpated. EEC does not have a specific requirement. During the inplant evaluations, however, the USDA procedures did not detect any units with lesions in this pouch.

USDA requires that equine tonsils be removed before tongue inspection. EEC requires that they be examined. During the study, the USDA procedures did not include examination of the tonsils; therefore, only the EEC procedures detected two units with tonsil lesions. These lesions were slight, localized and did not affect organ or carcass disposition.

USDA requires that equine mandibular, retropharyngeal and parotid lymph nodes be observed and palpated, and incised when necessary. EEC requires that they be incised and observed. Both procedures detected the same lesions.

USDA requires that the trachea be observed during lungs examination. EEC requires that the trachea be examined and opened lengthwise with the main branches of bronchi. The EEC procedures detected one unit with localized lesions which did not affect carcass disposition.

USDA requires that lungs be observed and palpated and not be saved for human consumption. EEC requires that they be incised in their posterior third, perpendicular to their main axes if saved for human consumption. Both procedures detected the same lesions; however, the lung incisions did not reveal additional diseases.

USDA requires that the bronchial and mediastinal lymph nodes be observed and palpated and incised when abnormal. EEC requires that they be incised and observed. In one equine plant, the units evaluated were free of lesions and, in the other one, both procedures detected the same lesions.

USDA requires that bile ducts be opened longitudinally. EEC requires that they be examined. In both plants, all units evaluated were free of lesions.

USDA requires that hepatic lymph nodes be observed and palpated. EEC requires that they be incised and observed. In one plant,

all units evaluated were free of lesions; in the other plant, both procedures detected the same lesions.

USDA requires that equine gastric, pancreatic and mesenteric lymph nodes be observed. EEC requires that they be incised and observed. In one plant, the gastric and pancreatic lymph nodes were free of lesions, and the mesenteric lymph nodes had lesions detected by both procedures. In the other plant, both procedures detected eight units with the same lesions in the gastric/pancreatic lymph nodes and six units in the mesenteric lymph nodes. The EEC procedures detected one different unit with lesions in the gastric/pancreatic lymph nodes and two in the mesenteric lymph nodes; these three units had small and localized lesions which did not affect carcass disposition.

USDA requires that equine kidneys be observed and palpated and the renal lymph node area be observed. EEC requires that kidneys be examined and renal lymph nodes be incised and observed. In both plants, both procedures detected that same lesions.

USDA requires that equine supramammary or superficial inguinal lymph nodes be palpated. EEC requires that the supramammary lymph nodes be incised and observed and the superficial inguinal lymph nodes be examined. In one plant, all units were free of lesions; in the other plant, both procedures detected the same lesions.

In carcasses and/or organs of equine animals slaughtered during the study, the lymph nodes were generally smaller and more visible than those of bovine and swine. Therefore, incising of the lymph nodes was revealed to be of little or no value.

CONCLUSIONS

The numerous and extensive evaluations conducted during this study on USDA and EEC post-mortem inspection procedures have revealed that the EEC procedures are not more effective than the USDA requirements routinely in use. EEC procedures, in general, are based on organ and/or carcass presentation methods of inspection which seem to be workable in plants with relatively low production rates. During this study, which included the performance of USDA and EEC procedures in 11 plants in the United States and 35,500 evaluations, the EEC procedures could be judged inferior for the following reasons:

1. Splitting equine heads in the median plane and excising the nasal septum for glanders, a disease not presently recorded in the United States, did not reveal any glanders. Only one abnormal unit showed an irrelevant chronic and localized lesion.

2. The second incision of the external masseters did not reveal lesions of diseases that were not revealed by the first incision.

3. Incision in the ventral surface of the tongue did not reveal any lesions, except one irrelevant, small and encapsulated lesion.

4. Observation and palpation of calf and swine tongues did not reveal any lesions.

5. Observation and palpation of the tonsils in swine did not reveal any lesions and, in bovine and equine, only revealed a few localized lesions.

6. Incisions of calf mandibular, parotid, bronchial, mediastinal and hepatic lymph nodes did not reveal any lesions.

7. Incisions of equine mandibular, retropharyngeal, parotid, bronchial, mediastinal and hepatic lymph nodes revealed the same lesions as the USDA procedures.

8. Incising the heart did not reveal any lesions in small calves and revealed the same lesions as the USDA procedures in large calves and swine. In cattle, the EEC additional incisions did not reveal all the lesions discovered by USDA procedures.

9. Opening the trachea and main branches of bronchi did not reveal any lesions in calves. It revealed the same lesions as the USDA procedures in equine and only three localized lesions in cattle.

10. Incising the lungs did not reveal any additional lesions in small calves and revealed the same lesions as the USDA procedures in cattle, large calves and equine.

11. Incising the bile ducts transversally did not reveal any lesions in calves and equine and, in cattle, did not reveal all distomatosis lesions as did the USDA longitudinal incisions.

12. Incisions of the gastric and pancreatic lymph nodes did not reveal any lesions in small calves. In cattle and large calves, they revealed the same lesions as the USDA procedures and, in equine, they only revealed one irrelevant localized lesion.

13. Incisions of the mesenteric lymph nodes in calves revealed the same lesions as the USDA procedures. In all other bovine and equine, they revealed only four irrelevant localized lesions.

14. Incising the cow uteri revealed the same lesions as uteri that were observed and palpated.

15. Skinning and splitting large calves and skinning small calves revealed the same lesions as the USDA procedures.

16. Incisions of the renal lymph nodes in calves did not reveal any lesions; in equine, they revealed the same lesions as the USDA procedures and, in cattle, they revealed five localized lesions associated with kidney pathologic conditions.

17. Incisions of the supramammary lymph nodes in calves did not reveal any lesions. They revealed two lesions associated with udder pathology in cattle, six lesions associated with lactating mammary glands in swine and the same lesions as the USDA procedures in equine.

18. Incisions of the superficial inguinal lymph nodes in bulls did not reveal any lesions. In boars, they revealed the same lesions as the USDA procedures.

19. Incisions of cow udders required by EEC did not reveal all lesions.

20. Removal of the serous part of the diaphragm from the muscular part did not reveal any lesions in large calves and, in cattle, revealed the same lesions as the USDA procedures. However, some cysticercosis lesions, which were detected in the diaphragm by performing the USDA expanded procedures, were not detected by examining the muscle tissues after the removal of the serous part as required by the EEC procedures.

21. All different lesions detected by the EEC procedures did not affect carcass disposition, nor were they of significant effective values.

In conclusion, as the result of the described studies, the hypothesis that--the USDA system of livestock post-mortem inspection is as effective as the EEC system at detecting and removing from the food supply diseased and abnormal product--has been found to be valid. It can, therefore, be further concluded that the EEC procedures have no public health benefits to contribute to the U.S. meat supply.

Appendix A
USDA Routine Post-Mortem Inspection

Bovine

The USDA routine post-mortem inspection procedures for steers, heifers, cows, bulls and large calves are:

Head Inspection

1. Incise lymph nodes attached to the tongue--suprapharyngeal, atlantal, mandibular.

2. Observe and palpate tongue.

3. Observe head's surfaces and eyes.

4. Incise and observe parotid lymph nodes, lateral and medial masticatory muscles.

Viscera Inspection

1. Observe eviscerated carcass.

2. Observe mesenteric lymph nodes and abdominal viscera.

3. Observe and palpate ruminoreticular junction.

4. Observe esophagus and spleen.

5. Incise and observe lungs' lymph nodes--mediastinal (posterior, middle, anterior) and bronchial (right and left).

6. Observe and palpate dorsal surfaces of lungs.

7. Incise heart, from base to apex or vice versa, through interventricular septum, and observe cut and inner surfaces.

8. Turn lungs over; observe ventral surfaces and heart's outer surface.

9. Incise and observe hepatic lymph nodes.

10. Open bile duct (both directions), and observe its content.

11. Observe and palpate liver's ventral surface.

12. Turn liver over, palpate renal impression, observe and palpate dorsal surface.

Carcass Inspection

1. Palpate superficial inguinal, or supramammary, and internal iliac lymph nodes.

2. Observe lumbar region.

3. Observe and palpate kidneys.

4. Observe diaphragm's pillars and peritoneum.

5. Observe and palpate diaphragm.

6. Observe pleurae, cut surfaces of muscles and bones, neck and carcass exterior.

Calves

The USDA routine post-mortem inspection procedures for small calves are:

Head Inspection

1. Observe head's surfaces.

2. Incise and observe suprapharyngeal lymph nodes--left and right.

Viscera Inspection

1. Observe and palpate lungs' lymph nodes--bronchial, mediastinal--dorsal surfaces of lungs and heart.

2. Turn lungs over, and observe ventral surfaces.

3. Observe spleen.

4. Observe and palpate dorsal surface of liver.

5. Turn liver over, observe ventral surface and palpate portal lymph nodes.

6. Observe stomach and intestine.

Carcass Inspection

1. Observe outer and cut surfaces of carcass.

2. Lift forelegs, and observe neck and shoulders.

3. Observe body cavities.

4. Observe and palpate internal iliac lymph nodes and kidneys.

NOTE: Inspection procedures of "hide-on" carcasses must include observation of hide for contamination, parasitic conditions and other abnormalities and palpation of back for grubs.

Udder

Under USDA inspection, lactating udders, udders of Brucellosis reactors, or mastitis elimination cows are not saved for human consumption. The inspection requirements of nonlactating cow udders are:

1. Suitable facilities for handling and inspecting them.

2. Proper separation of each udder and identification with carcass.

3. Observation and palpation by inspector.

4. At inspector's request, multiple incisions in sections not greater than 2 inches in thickness by plant employee.

5. Reinspection by inspector.

Swine

The USDA routine post-mortem inspection procedures for market hogs, sows, stags and boars are:

Head Inspection

1. Observe head and cut surfaces.

2. Incise and observe mandibular lymph nodes.

3. Observe/retain carcass, when required.

Viscera Inspection

1. Observe eviscerated carcass, viscera, and parietal (top) surface of spleen.

2. Observe and palpate mesenteric lymph nodes.

3. Palpate portal lymph nodes.

4. Observe dorsal surfaces of lungs.

5. Palpate bronchial lymph nodes.

6. Observe mediastinal lymph nodes.

7. Turn lungs over, and observe ventral surfaces.

8. Observe heart.

9. Observe dorsal surface of liver.

10. Turn liver over, and observe ventral surface.

11. Condemn viscera or parts when required.

12. Retain carcass, viscera and parts, when required.

Carcass Inspection

1. Look in mirror and observe back of carcass. Where mirror is not required, turn and observe back of carcass.

2. Observe front parts and inside of carcass.

3. Grasp, turn, and observe kidneys (both sides).

4. Direct trim, remove retain tags, or retain carcass when required.

NOTE: Inspectors must examine carcasses, organs and parts for diseases, abnormalities, cleanliness.

Swine Tongue

The USDA routine inspection procedures for swine tongues are:

1. Plant employee(s):

    a. Observe and palpate all tongues.

    b. Incise ventral surface in sows, stags and boars.

2. Inspector(s):

    Observe and palpate 10 percent of tongues.

Uteri

Under USDA inspection, gravid uteri are not saved for edible purposes. The inspection requirements of normal appearing uteri are:

1. Presentation with viscera so that uteri are easily observed.

2. Observation (and palpation when necessary).

3. Condemnation of uteri with pathological, physiological or anatomical abnormalities.

Equine

The USDA routine post-mortem inspection procedures for equine carcasses are:

Head Inspection

1. Observe head's surfaces.

2. Observe and palpate guttural pouch.

3. Observe and palpate (and incise when necessary) mandibular, pharyngeal and parotid lymph nodes.

4. Observe and palpate tongue.

Viscera Inspection

1. Observe eviscerated carcass.

2. Observe mesenteric lymph nodes and abdominal viscera.

3. Observe and palpate spleen.

4. Observe and palpate dorsal surfaces of lungs.

5. Observe and palpate (and incise when abnormal) bronchial and mediastinal lymph nodes.

6. Incise heart, from base to apex or vice versa, through interventricular septum, and observe cut and inner surfaces.

7. Turn lungs over; observe ventral surfaces and heart's surface.

8. Observe and palpate hepatic lymph nodes.

9. Open bile duct (both sides), and observe its content.

10. Observe and palpate ventral surface of liver.

11. Turn liver over, palpate renal impression, observe and palpate dorsal surface.

Carcass Inspection

1. Palpate superficial inguinal, or supramammary and internal iliac lymph nodes.

2. Observe lumbar region.

3. Observe and palpate kidneys.

4. Observe diaphragm's pillars and peritoneum.

5. Observe and palpate diaphragm.

6. Observe pleurae, cut surfaces of muscles and bones, neck and carcass exterior.

7. Observe (and incise when necessary):

a. Inner abdominal walls for encysted parasites.

b. Spinous processes of thoracic vertebrae, supraspinous bursa and first two cervical vetebrae for fistulous conditions.

c. Axillary and subscapular spaces of white and gray horses for melanosis.

Appendix B
USDA Expanded Post-Mortem Inspection for Bovine Cysticercosis and Eosinophilic Myositis

Bovine Cysticercosis

When a beef carcass is affected by cysticercosis, the veterinary medical officer shall:

1. Thoroughly incise lateral and medial masticatory muscles, heart, diaphragm and its pillars. The peritoneum must be removed before incising the diaphragm.

2. Observe and palpate tongue. If cysts are suspected in the muscular part, the tongue shall be thoroughly incised and observed.

3. Examine esophagus and all exposed muscular surfaces.

4. When cysts in a carcass are in two or more (of the above) sites, (a) make one transverse cut in each shoulder (2-3 inches) above the olecranon's point. This cut should extend to the humerus and expose the triceps brachii, (b) make one cut also in each round to expose the musculature in cross section.

When one beef carcass in a "lot" is found to contain a cyst, the following procedure shall be required on all carcasses in that lot.

1. Multiple incisions of the interventricular septum, external and internal muscles of mastication. Also, close observation shall be made of the esophagus and cut surfaces of muscles exposed during dressing operation.

2. If available and identified as part of the affected lot, hearts, and cheeks from carcasses which had passed inspection prior to finding the infected carcass shall be incised as above.

All live cysts must be submitted in formalin to the appropriate laboratory.

Eosinophilic Myositis

When a carcass is affected by eosinophilic myositics, the veterinary medical officer shall:

1. Thoroughly incise (with numerous incisions) and observe lateral and medial masticatory muscles and heart.

2. Observe and palpate esophagus.

3. Make several deep longitudinal incisions into the tongue.

4. Thoroughly incise and observe diaphragm and pillars, after removal of peritoneum.

5. Observe cut surfaces of muscles exposed during dressing operation. When lesions are in any of them, make several parallel incisions to all such cut surfaces. Also, after removing the peritoneum, thoroughly incise and observe abdominal muscles. If lesions are in any cut surface exposed during above procedures, affected primal part(s) shall be freely slashed and closely examined.

When the disease is localized and only certain parts are affected (head, tongue, heart, esophagus, diaphragm and pillars), such parts shall be condemned. When carcass muscles other than diaphragm and pillars are affected, disposition shall be as required by regulations.

Appendix C

STUDY TEAM

Name	Title	Specialty
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Planning/Evaluation Staff		
Ms. Patricia M. Abraham	Mathematical Statistician, MSD/SCI	Mathematics/Statistics
Dr. Robert Boschert	Staff Officer, PTD/MPITS	Inspection/Training
Dr. Albert M. Carey	Staff Officer, PED/SCI	Pathology/Epidemiology
Mr. William F. Daily	Staff Officer, LMR/AM	Labor Management Relations
Dr. Irwin Dubinsky	Director, PPP/PSU	Efficiency/Productivity
Mr. Herbert J. Harris	Branch Chief, IEDM/MPITS	Efficiency/Productivity
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GLOSSARY OF TERMS

SISP	Slaughter Inspection Standards and Procedures Division
MPITS	Meat and Poultry Inspection Technical Services
MSD	Mathematics and Statistics Division
SCI	Science
PTD	Program and Training Division
AM	Administrative Management
PED	Pathology and Epidemiology Division
PSU	Policy Studies Unit
LMR	Labor Management and Relations Staff
IP	International Programs
PPP	Policy and Program Planning
MPIO	Meat and Poultry Inspection Operations
IEDM	Industrial Engineering and Data Management Division
EC	Export Coordination Staff
FESD	Facilities, Equipment, and Sanitation Division
ICS	Inspection Coordination Staff
NER	Northeastern Region
NCR	North Central Region
WR	Western Region
SER	Southeastern Region
SWR	Southwestern Region

Appendix D
Step-by-Step Evaluation Techniques

A. Steers, Heifers, Cows, Bulls

Head Evaluation

1. Plant employee(s) left tonsils and larynx on tongues.

2. Inspector(s) performed USDA inspection.

3. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

4. Evaluator for EEC:

   a. Made #2 incision in external masticatory muscles and observed cut surfaces.

5. Evaluator/Recorder for EEC evluated (observed) and recorded diseases or abnormalities on EEC worksheets.

6. Plant employee(s) removed tonsils.

Thoracic Viscera Evaluation

1. Inspector(s) performed USDA inspection.

2. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

3. Evaluator for EEC:

   a. Made two additional incisions in heart from auricles to apex and observed cut surfaces.

   b. Opened trachea and main branches of bronchi lengthwise and observed.

   c. Incised lungs in their posterior third, perpendicular to their main axes and observed cut surfaces.

4. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

Abdominal Viscera Evaluation

1. Inspector(s) performed USDA inspection.

2. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

3. Evaluator for EEC:

a. Made a transverse incision across omasal impression of liver's ventral surface, cutting smaller branches of bile duct and observed cut surfaces (Figure 1).

b. Made a transverse incision across liver's ventral surface from beside and below caudate lobe cutting smaller branches of bile duct and observed cut surfaces (Figure 1).

c. Incised and observed gastric, pancreatic and mesenteric lymph nodes.

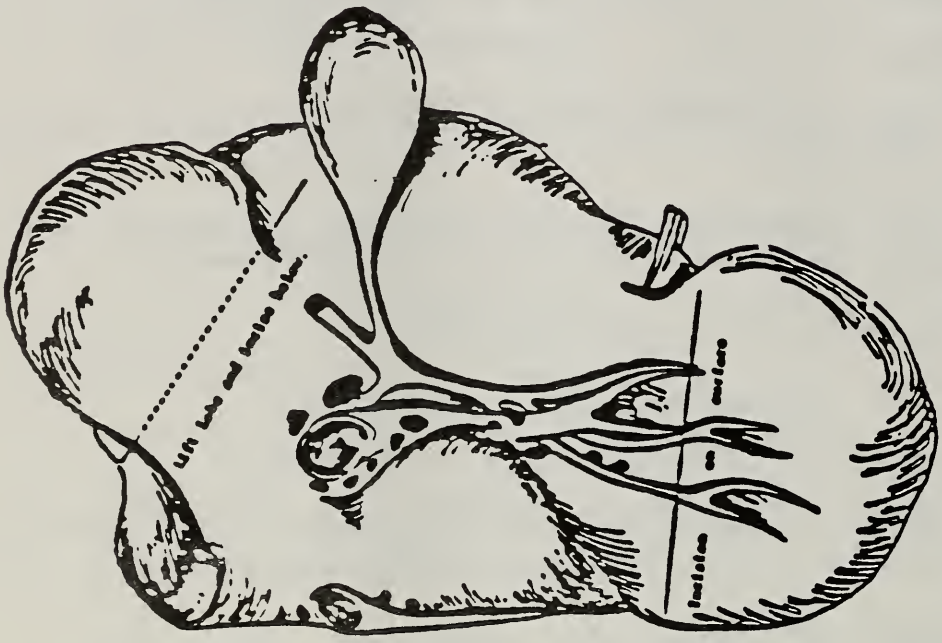

Figure 1

d. Incised and observed nongravid, normal appearing uteri (in cows).

4. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

Carcass Evaluation

1. Plant or inspection employee(s) exposed diaphragm's muscular part by removing serous part.

2. Inspector(s) performed USDA inspection.

3. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

4. Evaluator for EEC:

a. Observed spinal column.

b. Observed and palpated diaphragm.

c. Incised and observed supramammary or superficial inguinal and renal lymph nodes.

d. Incised and observed nonlactating udders (in cows).

5. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

B. Large Calves (over 6 weeks old)

Head Evaluation

1. Plant employee(s) left tonsils and larynx on the tongues.

2. Inspector(s) performed USDA inspection.

3. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

4. Evaluator for EEC:

a. Made #2 incision in external masticatory muscles and observed cut surfaces.

b. Examined--observed and palpated--tongue including larynx and tonsils.

c. Incised ventral surface of tongue lengthwise and observed cut surfaces.

5. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

6. Plant employee(s) removed tonsils.

Thoracic Viscera Evaluation

1. Inspector(s) performed USDA inspection.

2. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

3. Evaluator for EEC:

a. Made two additional incisions in heart from auricles to apex and observed cut surfaces.

b. Opened trachea and main branches of bronchi lengthwise and observed.

c. Incised lungs in their posterior third, perpendicular to their main axis and observed cut surfaces.

4. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

Abdominal Viscera Evaluation

1. Inspector(s) performed USDA inspection.

2. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

3. Evaluator for EEC:

a. Made a tranverse incision across omasal impression of liver's ventral surface, cutting smaller branches of bile duct and observed cut surfaces (Figure 1).

b. Made a transverse incision across liver's ventral surface from beside and below caudate lobe cutting smaller branches of bile duct and observed cut surfaces (Figure 1).

c. Incised and observed gastric, pancreatic and mesenteric lymph nodes.

4. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

Carcass Evaluation

1. Plant or inspection employee(s) exposed diaphragm's muscular part by removing serous part.

2. Inspector(s) performed USDA inspection.

3. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

4. Evaluator for EEC:

a. Observed and palpated diaphragm.

b. Incised and observed supramammary or superficial inguinal and renal lymph nodes.

5. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

6. Plant employee(s) removed skin and split carcasses.

7. Inspector(s) performed USDA inspection (reinspection).

8. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

9. Evaluator for EEC examined skinned surfaces and spinal column.

10. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

C. Small Calves (under 6 weeks old)

Head Evaluation

1. Plant employee(s) left tonsils and larynx on tongues.

2. Inspector(s) performed USDA inspection.

3. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

4. Evaluator for EEC:

a. Incised and observed head lymph nodes not incised by inspector(s).

b. Examined--observed and palpated--tongue including larynx and tonsils.

5. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

6. Plant employee(s) removed tonsils.

Thoracic Viscera Evaluation

1. Inspector(s) performed USDA inspection.

2. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

3. Evaluator for EEC:

a. Incised and observed bronchial and mediastinal lymph nodes.

b. Opened trachea and main branches of bronchi lengthwise and observed.

c. Incised lungs in their posterior third, perpendicular to their main axes and observed cut surfaces.

d. Incised heart from base to apex through interventricular septum and observed cut, inner and outer surfaces.

4. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

Abdominal Viscera Evaluation

1. Inspector(s) performed USDA inspection.

2. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

3. Evaluator for EEC:

a. Incised and observed hepatic (portal) lymph nodes.

b. Made a transverse incision across omasal impression of liver's ventral surface, cutting smaller branches of bile duct and observed cut surfaces (Figure 1).

c. Made a transverse incision across liver's ventral surface from beside and below caudate lobe cutting smaller branches of bile duct and observed cut surfaces (Figure 1).

d. Incised and observed gastric, pancreatic and mesenteric lymph nodes.

4. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

Carcass Evaluation

1. Inspector(s) performed USDA inspection.

2. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

3. Evaluator for EEC:

a. Observed and palpated diaphragm.

b. Incised and observed supramammary or superficial inguinal and renal lymph nodes.

4. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

5. Plant employee(s) removed skin from carcasses.

6. Inspector(s) performed USDA inspection (reinspection).

7. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

8. Evaluator for EEC examined skinned carcass surfaces.

9. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

D. Market Hogs, Sows, Boars

Head Evaluation

1. Inspector(s) performed USDA inspection.

2. Plant employee(s) freed tongues from heads and palpated them as required.

3. Inspector(s) observed and palpated 10 percent of tongues.

4. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

5. Evaluator for EEC examined--observed and palpated--tongue including larynx and tonsils.

6. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

Thoracic Viscera Evaluation

1. Inspector(s) performed USDA inspection.

2. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

3. Evaluator for EEC incised heart from base to apex through interventricular septum and observed cut, inner and outer surfaces.

4. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

Carcass Evaluation

1. Inspector(s) performed USDA inspection.

2. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

3. Evaluator for EEC:

a. Examined spinal column.

b. Incised and observed supramammary or superficial inguinal lymph nodes.

4. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

E. Horses

Head Evaluation

1. Plant employee(s) left tonsils and larynx on tongues.

2. Inspector(s) performed USDA inspection.

3. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

4. Evaluator for EEC:

a. Examined--observed and palpated--lymph nodes incised by inspector(s).

b. Incised and observed lymph nodes not incised by inspector(s).

c. Examined--observed and palpated--throat, including larynx and tonsils.

5. Plant employee(s) removed tonsils and split head in median plane.

6. Evaluator for EEC examined split surfaces of head, including nasal cavity, sinuses, etc.

7. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

Thoracic Viscera Evaluation

1. Inspector(s) performed USDA inspection.

2. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

3. Evaluator for EEC:

a. Examined--observed and palpated--bronchial and mediastinal lymph nodes incised by inspector(s).

b. Incised and observed bronchial and mediastinal lymph nodes not incised by inspector(s).

c. Opened trachea and main branches of bronchi lengthwise and observed.

d. Incised lungs in their posterior third, perpendicular to their main axes and observed cut surfaces.

4. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

Abdominal Viscera Evaluation

1. Inspector(s) performed USDA inspection.

2. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

3. Evaluator for EEC:

a. Incised and observed hepatic lymph nodes.

b. Made a transverse incision across omasal impression of liver's ventral surface, cutting smaller branches of bile duct and observed cut surfaces.

c. Made a transverse incision across liver's ventral surface from beside and below caudate lobe cutting smaller branches of bile duct and observed cut surfaces.

d. Incised and observed gastric, pancreatic and mesenteric lymph nodes.

4. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

Carcass Evaluation

1. Inspector(s) performed USDA inspection.

2. Evaluator/Recorder for USDA evaluated (observed) and recorded diseases or abnormalities on USDA worksheets.

3. Evaluator for EEC:

a. Examined spinal column.

b. Incised and observed supramammary of superficial inguinal and renal lymph nodes.

4. Evaluator/Recorder for EEC evaluated (observed) and recorded diseases or abnormalities on EEC worksheets.

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